

Math 0362
Practice Test 5

1. Multiply

$$\sqrt{3x} \cdot \sqrt{2}$$
$$\sqrt{6x}$$

2.

$$\sqrt{\frac{21}{100}} = \frac{\sqrt{21}}{\sqrt{100}} = \frac{\sqrt{21}}{10}$$

3.

$$\sqrt{\frac{2x^2}{49y^8}}$$

$$\frac{x\sqrt{2}}{7y^4}$$

4.

$$\frac{3\sqrt[3]{250a^7}}{\sqrt[3]{2a^1}}$$
 divide first

$$\sqrt[3]{125a^6}$$
$$3 \cdot 5a^2$$
$$15a^2$$

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1. Multiply

$$\sqrt{3x} \cdot \sqrt{2}$$
$$\sqrt{6x}$$

2.

$$\sqrt{\frac{21}{100}}$$

$$\frac{\sqrt{21}}{\sqrt{100}} = \boxed{\frac{\sqrt{21}}{10}}$$

3.

$$\sqrt{\frac{2x^2}{49y^8}}$$

$$\boxed{\frac{x\sqrt{2}}{7y^4}}$$

4.

$$\frac{3\sqrt[3]{250a^7}}{\sqrt[3]{2a}}$$

divide
first

$$\begin{array}{c} \textcircled{3} \sqrt[3]{125a^6} \\ \downarrow \quad \downarrow \quad \downarrow \\ 3 \cdot 5a^2 \end{array}$$

$$\boxed{15a^2}$$

5.

$$10\sqrt{75} - 2\sqrt{28} - 2\sqrt{27}$$

$$\begin{array}{ccc} \textcircled{125}\sqrt{3} & \textcircled{14}\sqrt{7} & \textcircled{18}\sqrt{3} \\ \rightarrow 5\sqrt{3} & \times 2\sqrt{7} & \rightarrow 3\sqrt{3} \end{array}$$

$$\underline{50\sqrt{3}} - 4\sqrt{7} - \underline{6\sqrt{3}}$$

$$\textcircled{44\sqrt{3} - 4\sqrt{7}}$$

6.

$$(7\sqrt{x} - 7)(6\sqrt{x} - 4)$$

$$42x - 28\sqrt{x} - 42\sqrt{x} + 28$$

$$\boxed{42x - 70\sqrt{x} + 28}$$

7. 2

$$\frac{2\sqrt{3}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$$

$$\textcircled{\frac{2\sqrt{21}}{7}}$$

8.

$$\frac{2}{5 - \sqrt{10}} \quad \begin{array}{c} \text{conjugate} \\ \frac{5 + \sqrt{10}}{5 + \sqrt{10}} \end{array}$$

Double Fall

Top	Bottom
$2(5 + \sqrt{10})$	$(5 - \sqrt{10})(5 + \sqrt{10})$
$\textcircled{10 + 2\sqrt{10}}$	$25 + 5\sqrt{10} - 5\sqrt{10} - 100$
	$25 - 10$
	$\textcircled{15}$

Top
Bottom

$$\boxed{\frac{10 + 2\sqrt{10}}{15}}$$

9.

$$\sqrt{4x-3} = 5$$

$$\begin{array}{r} 4x-3 = 25 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\frac{4x}{4} = \frac{28}{4}$$

$$x = 7$$

10.

$$\begin{array}{r} \sqrt{5x-4} - 2 = 2 \\ +2 \quad +2 \\ \hline \end{array}$$

$$\sqrt{5x-4} = 4$$

$$\begin{array}{r} 5x-4 = 16 \\ +4 \quad +4 \\ \hline \end{array}$$

$$\frac{5x}{5} = \frac{20}{5}$$

$$x = 4$$

11.

$$\sqrt{11-x} = (x+1)(x+1)$$

$$11-x = x^2 + x + x + 1$$

$$\begin{array}{r} 11-x = x^2 + 2x + 1 \\ -11 + x \quad +x \quad -1 \\ \hline \end{array}$$

$$0 = x^2 + 3x - 10$$

$$(x+5)(x-2)$$

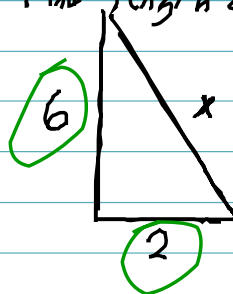
$$\begin{array}{r} x+5=0 \\ -5 \quad -5 \\ \hline \end{array}$$

$$x = -5$$

$$\begin{array}{r} x-2=0 \\ +2 \quad +2 \\ \hline \end{array}$$

$$x = 2$$

12. Find length of x



Pythagorean Thm

$$6^2 + 2^2 = x^2$$

$$36 + 4 = x^2$$

$$\sqrt{40} = \sqrt{x^2}$$

$$\sqrt{40} = \sqrt{x^2}$$

$$2\sqrt{10} = x$$

13. Simplify

$$i \sqrt[3]{54}$$
$$\sqrt[3]{9 \sqrt{6}}$$
$$3i\sqrt{6}$$

14.

$$(2-8i) + (9+5i)$$

$$11 - 3i$$

15.

$$5i(3-4i)$$

$$15i - 20i^2$$
$$= 1$$

$$15i + 20$$

16.

$$2i(5-8i)$$

$$10i - 16i^2$$
$$= 1$$

$$10i + 16$$

17.

$$(2-5i)^2$$

$$(2-5i)(2-5i)$$

$$4 - 10i - 10i + 25i^2$$

$$4 - 20i - 25$$

$$\boxed{-21 - 20i}$$

18. Use Quadratic formula

$$x^2 + 5 = 6x$$

$$a = 1$$

$$b = -6$$

$$c = 5$$

$$x^2 - 6x + 5 = 0$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(5)}}{2(1)}$$

$$\frac{6+4}{2} = \frac{10}{2} = \boxed{5}$$

$$\frac{6 \pm \sqrt{36 - 20}}{2}$$

$$\frac{6 \pm \sqrt{16}}{2} = \frac{6 \pm 4}{2} \rightarrow \frac{6-4}{2} = \frac{2}{2} = \boxed{1}$$

19.

$$x^2 - 6x + 13 = 0$$

$$a = 1 \quad b = -6 \quad c = 13$$

$$\frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(13)}}{2(1)}$$

$$\frac{6 \pm \sqrt{36 - 52}}{2}$$

$$\frac{6 \pm \sqrt{-16}}{2}$$

$$\frac{6 \pm 4i}{2} = \boxed{3 \pm 2i}$$

20.

$$2x^2 + 7x - 4 = 0$$

$$a = 2 \quad b = 7 \quad c = -4$$

$$\frac{-7 \pm \sqrt{7^2 - 4(2)(-4)}}{2(2)}$$

$$\frac{-7 \pm \sqrt{49 + 32}}{4}$$

$$\frac{-7 \pm \sqrt{81}}{4}$$

$$\frac{-7+9}{4} = \frac{2}{4} = \boxed{\frac{1}{2}}$$

$$\frac{-7-9}{4} \rightarrow \frac{-16}{4} = \boxed{-4}$$

21.

$$(x+4)(x+2) = 7$$

$$x^2 + \underline{2x} + \underline{4x} + 8 = 7$$

$-7 \quad -7$

$$x^2 + 6x + 1 = 0$$

$$a=1 \quad b=6 \quad c=1$$

$$\frac{-6 \pm \sqrt{6^2 - 4(1)(1)}}{2(1)}$$

$$\frac{-6 \pm \sqrt{36-4}}{2} \rightarrow \frac{-6 \pm \sqrt{32}}{2} = \frac{-6 \pm 4\sqrt{2}}{2} = \boxed{-3 \pm 2\sqrt{2}}$$

22. Find the vertex

$$f(x) = x^2 + 2x - 8 \quad a=1 \quad b=2$$

$$\text{vertex} = \frac{-b}{2a} = \frac{-2}{2(1)} = \frac{-2}{2} = \boxed{-1} \quad \text{Now plug into equation}$$

$$(-1)^2 + 2(-1) - 8$$

$$1 - 2 - 8 = \boxed{-9}$$

$$\text{vertex} = (-1, -9)$$